Discussion

The USPTO rejected claims 1, 2, 4-14, 17-21 and 23-24 under 35 U.S.C. §103 as being unpatentable over Japanese Application 06 039 235 (hereinafter JP '235). The applicants respectfully traverse this rejection. The remaining claims were merely objected to.

The applicants have invented a process for the production of plate-shaped pressed bodies (wafers) having a thickness of less than 700 µm comprised of an inorganic sorbent and a binder mixed at a particular ratio. These plate-shaped bodies are obtained by a process comprising compressing a mixture containing at least one inorganic sorbent and at least one binder at a pressure of at least about 70 MPa, wherein the weight ratio of the sorbent to the binder is between 4:1 and 0.7:1 and wherein the water content of the mixture, prior to compression determined at 160°C, is between 8 and 20%. Following compression, the compressed mixture is calcined at a temperature of at least 500°C to form the pressed body. The applicants respectfully assert that JP '235 fails to teach the plate-shaped pressed bodies that are claimed in the application, as well as the process for the manufacture of those pressed bodies.

The applicants first note that the translation of JP '235 is very difficult to understand and, as best understood, certainly fails to teach key aspects of the invention as follows:

Water content of material used for making compressed mixture is not taught.

Pursuant to the claims of the application, the water content of the mixture must be between 8 and 20% determined at 160°C during compression. (See lines 6-10 of Claim 1.) In contrast, in JP '235 the water content is always close to 0% prior to formation of the pressed bodies by compression. Although the alumina is "rehydrated" as part of the process of manufacture of the JP '235 product, the granulates obtained therein are then calcinated before the compression step. (See ¶0007 and 0014.) As the granular material used for the tablets of JP '235 is calcined at 200°C to 600°C, all loosely bound water in the granular material is driven off and the water content of the mixture is reduced to approximately 1%. (See each of the examples.) In Examples 1 and 3 and Comparison Example 6 of JP '235, the calcination temperatures are required to be 250°C or 475°C to produce good products. As a result of this calcination, the compressed product will have a water content at 160°C of zero percent. In contrast, note that Comparison Example 6, which is dried at only 100°C, has 20% cracks and thus produces a bad product. Accordingly, a person skilled in the art reviewing JP '235 would be taught that it is necessary to calcine the product before compression at high temperatures. This calcination reduces the quantity of water present in the pressed bodies to close to 0%. In contrast, a water content of 8% to 20%

is required for the compressed mixture by the claims of the application during compression.

Thickness of shaped body of the '235 Patent is significantly greater.

The shaped body of the application is required to be less than 700 µm. (In Claim 9 the thickness of the pressed body is required to be from about 200 to about 400 µm.) In contrast, the zeolite and alumina are granulated in a mill in JP '235 to a particle size of about 0.7 mm. (See ¶0021.) (In Claim 12 not more than 15% of the particles are greater than 250 µm in diameter and in Claim 13 not more than 8% of the particles are greater than about 200 µm. See also Claim 14.) The relatively large particle size of the particles of JP '235 results in products having a thickness of from 3 mm to 1 cm (see ¶0015). This thickness is significantly greater than the thickness of the pressed bodies of the application. The necessity for preparing a composition that can be used to produce pressed bodies with a thickness of only 700 µm requires a significantly different process than is taught by JP '235. JP '235 does not teach or suggest how such thin wafers can be produced. While the USPTO states that the thickness is "inherent", a thickness of only 700 µm for the pressed bodies is not possible if the starting material particles have a particle size of 0.7 mm.

Requirement of high temperature calcination before pressing in JP '235.

JP '235 requires that the composition be calcined at a high temperatures, preferably at least 475°C, prior to pressing the components together. (See each of the examples.) In contrast, the claims of the application require that the components be heated to only 160° as they are being pressed. By treating the composition of the application in this manner, the loosely bound water which is present at a content of 8 to 20%, is retained in the composition to influence the behavior of the mixture during the pressing process and the quality of the final product. In contrast, the process of JP '235 requires that the granulates are calcined at high temperature before pressing, which drives off this loosely bound water. The only example where high temperature calcination is not utilized in JP '235 is Comparison Example 6, which produces products which crack. Thus, JP '235 again teaches away from the process that is disclosed and claimed for the production of the composition of the claims of the application.

The composition is different.

JP '235 teaches that the binder to zeolite ratio is 1:30 wt. of binder to 100 wt. of zeolite, corresponding to a ratio of 3.3:1 to 100:1. (In the Examples the ratio was generally 100:8, a ratio much higher than the claimed ratio.) In fact, Comparison Example 4

of JP '235 clearly shows that when the ratio of the zeolite to the binder is reduced to 2:1, the product produced is very brittle. In contrast, the composition of the material, as claimed in Claim 1 has a sorbent to binder ratio of 4:1 to 0.7:1 sorbent to the binder. (Claim 10 requires the ratio to be 1.5:1 to 1:1.) Thus, the teaching of JP '235 again teaches away from the claimed ratio of the application, wherein the ratio of the sorbent to the binder is much closer to 1:1.

CONCLUSION

For all of these reasons, the applicants assert that JP '235 does not teach the product of any of the claims of the application. The applicants request that this Response be carefully reviewed and all claims allowed. If there are any questions, please contact applicants' counsel.

Respectfully submitted,

Scott R. Cox
Reg. No. 31,945
LYNCH, COX, GILMAN & MAHAN, P.S.C.
500 W. Jefferson Street, Suite 2100
Louisville, Kentucky 40202
(502) 589-4215

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